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ABSTRACT

A study of National Technical Institute for the Deaf students who are cross registered into the other colleges of the Rochester Institute of Technology was part of an ongoing research project on mainstreaming. The initial study addressed three issues: the best methodology to employ, the research hypotheses which might be generated from the data collected, and the possibility for researchers and instructors to cooperate for mutual benefit. Observations were conducted during the regular summer quarter in Social Work classes. Classroom observation was supplemented by formal and informal interviewing for data collection. Findings of the study yielded the following conclusions: it is advantageous to use a number of information sources for naturalistic research: a combination of qualitative and quantitative techniques, of observation and interviewing, and incorporating both the view of the insider and the outsider, are all important for a valid picture of the classroom; instructors are chiefly responsible for the active participation of hearing impaired students in the activities of the class; and it is possible for researchers and instructors to cooperate for classroom research to the benefit of both. (Author/SB)

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NATURALISTIC RESEARCH ON MAINSTREAMING AT THE NATIONAL TECHNICAL INSTITUTE FOR THE DEAF

Paper Series No. 43
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NTID's principal goal in doing research is to influence the education, training and career placement of deaf citizens through systematic examination of issues related to deafness. As one part of NTID's total research effort, the Department of Research and Development conducts descriptive and experimental research. Research findings are used in the development of programs and materials in the areas of learning and instruction, personal and social growth, and career development of deaf students. This document was developed in the course of an agreement with the U.S. Department of Health, Education and Welfare.

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EDUCATIONAL IMPLICATIONS OF NATURALISTIC RESEARCH ON MAINSTREAMING AT THE NATIONAL TECHNICAL INSTITUTE FOR THE DEAF

The study which is reported in this paper is part of an ongoing research project on mainstreaming at the National Technical Institute for the Deaf (NTID). The goals for this research effort are to better understand and to facilitate the experience of hearing impaired students in the regular school classroom. These goals are being realized through the study of NTID students who are cross-registered (that is, mainstreamed) into the other colleges of the Rochester Institute of Technology (RIT). Such studies include a look at support services, classroom dynamics, instructor and student perceptions, and student characteristics.

This initial study was an exploratory effort concerned with addressing three issues. These were as follows: The best methodology to employ; the research hypotheses which might be generated from the data collected; and the possibility for researchers and instructors to cooperate for mutual benefit.

These three issues were addressed through a study conducted in two classes of the Social Work department at RIT during the summer of 1980. Classroom observation was supplemented by formal and informal interviewing for data collection.

Findings of the study yielded the following conclusions which apply to the three issues: It is advantageous to use a number of information sources for naturalistic research. A combination of qualitative and quantitative techniques, of observation and interviewing, and incorporating both the view

of the insider and of the outsider are all important for a valid picture of the classroom.

Areas of concern and challenge to hearing-impaired students have been identified as those of class participation, social interaction, and student feelings about themselves and their experiences. It is hypothesized that the effective integration of the hearing-impaired into the regular classroom is achieved only through the active efforts of everyone involved. Instructors, particularly, will facilitate the participation of the hearing-impaired by actively regulating the flow of class discussion. Social interaction depends on the proper use of the interpreter and on the in-class contacts which are fostered between hearing and hearing impaired. The feelings students have about themselves and about being mainstreamed are closely tied to their perceptions of being treated as full-fledged students and not as special cases because of their hearing impairment.

There is also evidence in this study that instructors and researchers can cooperate in classroom research effectively and that both can benefit from the effort. Observational data may be used by instructors for instructional improvement. Input from instructors may help to strengthen research data.

The findings of this study are clearly applicable to educational practice in a number of ways. Our analyses tend to indicate that effective mainstreaming occurs when hearing-impaired individuals are able to function, both socially and academically, on a level commensurate with their hearing peers. However, effective mainstreaming does not take place in a vacumm. Simply placing the hearing-impaired students into the regular classroom and providing them with support services is not sufficient to insure successful integration

for all students. Hearing-impaired students may receive adequate grades when this is done. However, they may well be deprived of the enriching experience which comes from taking an active role in class activities and from working with hearing students, unless deliberate efforts are made to involve them. The interpersonal skills gained from such involvement may be invaluable to students' classroom learning as well as to their success in the working and social world beyond the classroom.

The results of this study indicate that instructors are chiefly responsible for the active participation of hearing-impaired students in the activities of the class. It is important, therefore, that instructors of mainstreamed classes be given adequate preparation and support for dealing with the students they must teach. In some instructional areas at RIT this is already being done. Further research is needed in order to determine how to best provide a system of faculty orientation to deafness and teaching support on a campus-wide basis. Orientation to mainstreaming for both hearing and hearing-impaired students is also indicated.

A second implication of this research study is for the support services provided to mainstreamed students. These services are absolutely necessary for the success of most hearing-impaired students. None of our findings should be construed as implying otherwise. However, this research does suggest that support should be provided in a manner that does not stigmatize students nor set them apart from their classmates. The balance between students' need for assistance and their need for equity is difficult to achieve. Further research is clearly indicated on the social and academic implications of support services and their impact on student development.

What aspects of the present system are good and should not be changed? Should support services be cut back as a student progresses through a program? Should support be made available in some way to all students -- perhaps on a fee system? Does dependency on support hinder an individual later on the job? If so, what transition is needed to meet the demands of the regular work world? All of these are questions which should be addressed in a future look at support services. Until that time, it behooves those who are providing the services to be aware of students' needs, not only for assistance, but for self-respect and independence as well.

This research has also demonstrated that it is possible for researchers and instructors to cooperate for classroom research to the benefit of both. More directly for education practice, however, it points to the need for instructors to utilize information on their own classroom behavior in order to plan and improve their instruction. The isolation of the teacher in the classroom clearly militates against the systematic improvement of teaching practice. What does take place is generally done on a trial and error basis. More desirable would be the institution of a system of professional or peer evaluation and feedback similar to that currently in use at NTID. Such a system would, of course, have to take into account the concerns for confidentiality and for preserving the integrity of the instructor-class relationship.

Finally, our research is beginning to indicate that whatever instructors do to help the hearing-impaired students in their classroom can be beneficial to hearing students as well. That is, we postulate a spread of effective teaching which reaches out to all students. Educationally, this implies that

whatever is done to improve the classroom experience of mainstreamed, hearing-impaired students does not do so at the expense of the hearing student. It is clear that handicapped and non-handicapped students have many similar needs and both can benefit from efforts to improve education in the mainstream.

ABSTRACT

Naturalistic research on mainstreaming is being conducted among hearing impaired students from NTID who are cross-registered into classes at the other colleges of RIT. A preliminary study was conducted with three goals in mind: (1) to judge the utility of various observational techniques, (2) to identify and investigate some important research questions, and (3) to provide for reciprocity between researchers and instructors. It was concluded that participant observation is an effective technique for exploratory research and that triangulation of methods is important to the validity of a study. Important behavioral categories include level of Participation, Interaction, and Feelings. In addition, reciprocity enables instructors to benefit from having researchers in the classroom.

NATURALISTIC RESEARCH ON MAINSTREAMING AT THE NATIONAL TECHNICAL INSTITUTE FOR THE DEAF

Every spring at commencement exercises the National Technical Institute for the Deaf (NTID) lists among its graduates persons who receive associate's, bachelor's, and master's degrees from the other colleges of the Rochester Institute of Technology (RIT). These students, during their years at RIT, have taken part in what might be termed the "ultimate mainstreaming experience." That is, at RIT, hearing-impaired students take courses and enter college-level programs in a traditional, hearing environment. Their experience is unusual, if not unique. In few other college settings do so many students with a single, common handicap attend classes among non-handicapped peers in a classroom environment not designed specifically for their needs. In order that they may contend with the challenges presented by this hearing environment, NTID provides hearing-impaired students with a variety of support services. These range from interpreters to tutors and notetakers.

To the educational researcher interested in the practice of mainstreaming, this concentration of hearing-impaired students and their support services provides a unique opportunity to study the academic integration of handicapped and non-handicapped students at the post-secondary level. Even though handicapped persons are attending colleges and universities in greater numbers today than ever before, rarely do they congregate in numbers large enough to make extensive study feasible.

To the researcher interested in the education of the deaf, NTID students at RIT provide the opportunity to study a group of academically successful

hearing-impaired persons in a variety of post-secondary programs. At one end of the continuum are the students whose educational experience is confined solely to NTID itself, receiving their certificate or diploma in one of NTID's many technical programs. At the other end are the students who have little academic contact with NTID, but who depend on the support services offered while participating fully in the programs offered by other RIT colleges. Between these two extremes are those students who have some experience in both areas--art students who spend a year at NTID before entering the regular program at RIT, students in NTID's associate's degree programs who take some courses in the college of General Studies. NTID has a total of about 900 students. Of these, approximately 200 take at least one course each quarter in the other colleges of RIT.

The paper which follows describes the initial field study on the mainstreaming of the hearing impaired which is being carried out among these NTID students at RIT. The major portion of the paper is concerned with three issues which were addressed in the study being described. These issues involve the instrumentation problems involved with observational methodology and data collection; the description of the mainstreaming experience of hearing-impaired students at RIT as well as the generation of research hypotheses in regard to that experience; and the provision for reciprocity between instructors and researchers.

It must be made clear at the outset that what is being reported and described is the beginning of an on-going research effort and not a single

study or series of studies. At the present time we are concerned with the accurate description of the practice in question through the use of classroom observation and with the generation of hypotheses. Observational methods will continue to play a central role in our studies. However, in the future, correlational and experimental use of such data will help to define more precisely the parameters of successful mainstreaming.

The next section of this paper presents the perspectives and assumptions about the practice of mainstreaming which shape this ongoing research effort. It is important to bear these positions in mind when considering the report of the study itself. They clearly delimit the research focus in all respects. For example, the choice of an observational methodology arises from a concern for the mainstreaming process as it occurs in situ.

Perspectives

A General Perspective On Mainstreaming

"Mainstreaming" is one of the most widely used and yet one of the most poorly defined words in the educational lexicon today. Therefore, anyone choosing to address the topic of mainstreaming must first confront the ambiguities inherent in that term and clarify his/her own position in regard to it. It will be maintained throughout this presentation that mainstreaming is best viewed as both the partial and complete integration of handicapped and non-handicapped students in the regular classroom. In addition, mainstreaming will be viewed as a means to the end of providing an appropriate education for handicapped persons rather than as an end in itself.

The wide use of the term mainstreaming arises from its strong identification with the "least restrictive environment" clause of Public Law 94-142.

This law mandates a free, appropriate public education for all handicapped children among their non-handicapped peers as much as possible. The need to implement the dictates of that law has become one of the strongest demands placed on the resources of local educational agencies in terms of both money and personnel. It is little wonder, then, that mainstreaming has gained such wide usage in recent years.

The term in question is also poorly defined in the sense that it has no single, widely accepted meaning. To many persons, mainstreaming, like least restrictive environment, means the total integration of the handicapped individual into the regular school classroom. According to this view, the handicapped student is tossed into the mainstream of education to sink, swim, or float along with the current. These persons are the ones who look for alternatives to mainstreaming and decry the disservice done to the handicapped who are dumped into a situation with which they are unable to contend. Their concerns are not unfounded as, too often, a child's right to an appropriate education is subordinated to the desire to show compliance with the law through normal class placement.

However, to other users, the term mainstreaming encompasses a whole variety of alternative services, only one of which involves the total integration of the handicapped into the regular classroom. Rather than looking for alternatives to mainstreaming, these persons talk of alternative <u>forms</u> of mainstreaming or different mainstreaming <u>options</u>. By this definition, there may be many different degrees of mainstreaming and periods of time in which handicapped students may be integrated with the non-handicapped. This definition is closely aligned with that put forth by Semmel, Gottlieb, and

Robinson (1979) in which they emphasize the temporal integration of the handicapped and non-handicapped.

In the research which we are conducting, mainstreaming will be looked upon in the latter sense--as having a number of alternative options. This perspective corresponds most closely with the experience of the hearing-impaired students at RIT who are the focus of our studies. It also agrees conceptually with a second general perspective that mainstreaming is part of the educational process rather than an educational outcome.

The primary goal of mainstreaming is to achieve an appropriate education for the handicapped individual and not to achieve total integration for all handicapped students per se. This means that mainstreaming should be looked upon as part of the instructional process. It is, essentially, considering the environment a variable which may be selected to meet the needs of each student. As part of the educational process, then, mainstreaming is a means rather than an end in itself (Bishop, 1979). Such a viewpoint directly impinges on educational practice. However, it also directs the course of any research which is conducted in that domain.

The general perspectives on mainstreaming--as a set of flexible options for the integration of the handicapped and non-handicapped students in the classroom and as a means rather than an end--may be applied to students at all educational levels and types of handicaps. At RIT, however, we take a more focused, specific view of people with special needs in a specialized setting.

A Post Secondary Perspective On Mainstreaming of the Hearing Impaired

To begin research on mainstreaming[1] among hearing-impaired students at the college level may seem to first appearances to be of questionable value. There is little about this population that may be characterized as typical of the mainstreamed handicapped in general, or even of the hearing impaired in general. Therefore, it must be made explicit that the focus of this work is not to characterize the average handicapped student in an average mainstreamed setting. Rather, it is a look at students who are successfully mainstreamed despite a handicap in the most important element of the classrooms in which they find themselves. That is, students with aural-oral deficiencies are expected to learn in a predominently aural-oral environment. It is also an environment not easily amenable to change. A study in this situation, therefore, will be a study of successful compensation and adaptability on the part of students and their support services.

The idea that it is important to study successful mainstreaming rather than mainstreaming in general has been put forth by other researchers in other studies (e.g. Bogdan & Barnes, 1979). This position can be justified by the fact that in mainstreaming we are looking at an educational practice rather than a naturally occuring characteristic of persons or at a theoretical construct. We are initially concerned with studying the practice when it works

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[1] It may be debated as to whether or not the term mainstreaming is appropriately applied to a group of post-secondary handicapped students. Whatever the merits of the term as an accurate descriptor, it is being used in this paper to preserve overall continuity with the practice of educating the handicapped and non-handicapped in the same classroom. At RIT, mainstreamed NTID students are referred to as "cross-registered" students.

well, rather than how it works on the average. Mainstreaming is assumed to be successful at RIT since hearing impaired students are able to choose a program to suit their needs and to obtain a degree in that program. This is not to imply that there is no room for improvement in programs currently being implemented at RIT. Certainly, future research will be conducted with changes in mind. However, the overall quality of the present program and the success of its students warrants its study as an example of successful mainstreaming at this time.

A second purpose in studying mainstreamed hearing-impaired students at the post secondary level is to learn from them. Clearly, these individuals have been successful in meeting the demands of the academic situation. They are accomplishing what the parents and teachers of handicapped students at elementary and secondary levels hope their children will accomplish. What can we learn from the successful student that can be taught to succeeding generations of students? What are their learning styles and strategies; their attitudes toward themselves and others; and their background experiences? How do they cope with their deafness and with the expectations and prejudices of hearing persons?

The perspectives on mainstreaming which have been presented demand a research methodology which can focus on the needs and experiences of individual students as well as on the classroom process. Classroom observation is the ideal research perspective to fill this requirement. In adopting an observational methodology, we also collect data on a different set of variables than we are likely to do otherwise. Thus, we will focus on the setting and the social climate of the classroom; on the interactions between persons; and on

the perceptions of such individuals as instructors and support persons, as well as both hearing and hearing-impaired students.

A Naturalistic Perspective on Mainstreaming

As the title to this paper indicates, a naturalistic approach was chosen for the initial mainstreaming research with classroom observation as the major method used. The arguments which have been put forth thus far stress the need to study the mainstreaming process as it takes place in the classroom and to tap the experience of hearing-impaired students who are successful in the academic situation. A third reason for this approach to mainstreaming is that it is a valuable means for identifying hypotheses and important variables which simply has not been used before at the post-secondary level.

An extensive search of the literature has revealed no observational studies among the mainstreamed hearing impaired--nor, indeed, among handicapped students in general--at the college level. We have, then, the opportunity to break new ground in the search for, eventually, a theory of successful mainstreaming. We contend that the parameters of successful mainstreaming have not been fully specified and that process variables must be taken into consideration as much as outcome variables. Variables identified in the course of an observational study are well grounded in data which gives extra credibility to their use.

The current study uses three data sources: participant observation, systematic observation or interaction analysis, and interviewing. These three techniques provide for a combination of data sources, a process often referred to as "triangulation."[2] Such a process helps to insure the validity of the

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[2]Triangulation implies three sources. However, the term may be used to refer to the combination of any number of information sources--records, documents, etc.--as well as observations and interviewing.

data collected and the conclusions drawn from it. In this study, we were also interested in judging first hand the relative merits of the two observational techniques and for determining the most satisfactory means of data collection.

The perspectives which have been outlined in the foregoing section should be taken into account by the reader in the description of the study which follows. It must be pointed out that the concern for perspective and methodology arises from the fact that this is, indeed, pioneering work. It is believed that the positions which have been taken provide the most comprehensive approach to the study of mainstreaming at this level. The discussion of the study in the final portion of this paper demonstrates how these perspectives have been incorporated into our work.

THE STUDY

In the summer of 1980, the first of a series of observational studies was conducted among hearing-impaired students at RIT. The observations were conducted during the regular summer quarter in Social Work classes. The goals for the study have been referred to in the previous discussion. More precisely these are as follows:

1. Instrumentation: To determine the methods of collecting observational data which will be the most efficient as well as the most effective and least obtrusive in the classroom.
2. Data Collection: To collect initial data and to use it to generate hypotheses about the mainstreaming process and the experience of hearing-impaired students in the classroom.
3. Reciprocity: To provide for the mutual benefit of instructors and researchers through their cooperation in the efforts to gather and use classroom data.

The Sample

The classes participating in this study were two upper-division Social Work classes which were concerned with third year students' field placement experience in local social agencies. Two classes were observed. However, the same students participated in both classes, although the instructors, content, and teaching method were different. The classes met one day a week--one for two hours in the morning and the other for three hours in the afternoon.

The Social Work Department was an ideal area to begin a study such as is being described. Hearing impaired students make up as much as 25% of the students enrolled in that department. These students have high academic ranking when compared to other cross-registered NTID students (Long & Coggiola, 1980). This is reflected in their test scores and in the fact that the Social Work program has higher entrance requirements than most other RIT programs. Social Work faculty and students are unusually sensitive to the needs of the hearing impaired. Many of these people use sign language expertly. The members of the NTID support team who provide needed services for NTID students have an excellent standing in the department as a whole.

Social work classes, particularly at the upper division level, are conducted in a manner which allows for much student participation. This is in contrast to the lecture format more typical of college classes. In the morning class, particularly, students were able to express ideas and feelings freely. Therefore, more could be learned about the students and their experiences than in the usual college classroom.

Access to the classes was obtained through the head of the support team, who contacted the instructors. Both instructors were fully briefed on the

purpose of the study and readily gave their consent for the observations to take place. They did, however, require that the students in their classes also consent to the observer's presence. This was accomplished during the first class period in each of the sections. Students asked questions about research method and its purpose. Since concerns for confidentiality are common ground between researchers and social workers, it was a relatively simple matter to achieve an understanding (with these students) of the safeguards used with the data.

An added feature of the instructional situation being observed was the presence of the NTID support team educational specialist in the morning class. He was responsible for supervising the hearing-impaired students in their field placement. Because of this, he took part in the class as a co-instructor in order to assist them better and to share their perspective. This was the standard practice in the social work department, although this particular person was more actively involved in teaching the class than most. Both instructors asked the researcher to give them feedback on their attempts to coordinate their teaching or leading efforts. This was possible since instruction was not a primary focus of the study. The arrangement allowed for reciprocity with these instructors. It also became the first step in a more formal study in instructional improvement, which will be reported at a later date.

Methodology

As mentioned earlier, the two observational methods, participant observation and systematic observation, were chosen in order to use and to judge the efficacy of both qualitative and quantitative methods of data collection. It was believed from the onset that both methods would be useful in combination,

but this belief was open to examination in actual practice. Ethnographic interviewing was added to supplement the two observation systems by getting at student perceptions of the class situation.

Participant Observation

Qualitative data were collected through the method of participant observation in the classes studied. "Participant Observation is a commitment to adopt the perspective of those studied by sharing their day-to-day experiences." (Denzin, 1978, p. 182) Thus, the first author spent time in the classroom with the hearing-impaired students in order to better understand their experiences in a hearing environment. There are many ways to conduct field studies using participant observation. The method used in this study was deemed best suited to the needs of the project.

Observations were made in the two selected classes for at least one hour each per week. Observation times were alternated every week between the first half of the session and the second half in order to get a representative picture of the classes. Data collecting sessions longer than one hour were deemed too fatiguing for the observer.

Data in the form of brief notes were taken as unobtrusively as possible during the class sessions. After the observations were over, the notes were expanded into a narrative of the class session and recorded onto a dictaphone cassette tape. A typist transcribed the notes in a standard form which made them suitable for future analysis. A sample of the protocol is found in Appendix A. These notes helped to direct the course of future observations as themes of importance and interest emerged from preliminary analysis.

After the ten weeks of observation were completed, the entire set of notes was systematically analyzed in full. Relationships between events were found according to a set of categories. These categories helped to define the important themes of the settings observed.

Systematic Observation

Systematic Observation, which involves the use of a coding system, is a quantitative method for recording classroom behaviors. The coding system used in this study focuses on the exchanges between individuals in each setting.

Generally, coding systems provide information about the frequency of certain behaviors and/or duration of those behaviors. They involve a list of descriptive, non-overlapping categories of behavior which is used by a trained observer to record who behaves, what kind of and how much behavior, and the sequence of events. (Layne, 1979).

Coding systems may be differentiated by how behaviors are recorded. (Sackett, 1978). One type of measurement is continuous, real-time measurement. This measurement occurs when every frequency or duration of codable behavior is recorded during the observation session. This method may be contrasted with discontinuous probe-time samples, where recording is either done instantaneously at the end of set time periods or for a short duration at the end of set time intervals.

Coding systems also may differ in whether they preserve the order of encoding and individual code duration. Preservation is essential for sequential analysis and for identifying time-related patterns and cycles in the flow of behavior.

A coding system must be chosen to record behavior in keeping with the goals of the research being conducted. The exploratory, descriptive work currently being done on mainstreaming demands a system which preserves as many dimensions of classroom interaction as possible.

The OSIA. The coding system employed in the present study is the Observational System for Instructional Analysis (OSIA) developed at The Ohio State University (Hough, 1980). The OSIA involves continuous, real-time measurement and does preserve order of encoding and individual code duration.

The system is powerful for several reasons. First of all, it can be expanded and/or manipulated to suit one's needs, an essential feature in studying the hearing impaired. Secondly, computer programs have been developed to help analyze raw data and generate, as well as help answer, research questions.

Since the system uses continuous, real-time measurement, the encoding is a demanding process. In a coding session, a coder designates instructional situation, general nature of participants and focus. The source, behavior code, mode of communication, time and subscript is then coded for each behavior that occurs. Generally, students are not differentiated, except to designate when different students are interacting or responding to the same question.

Interviewing

Observational techniques provide the means for obtaining a good perspective on the classroom process. However, they are data sources dependent on the view of the outsider. Thus, they are subject to possible bias in interpretation no matter how complete the participant observer's field notes or how objective the categories of the coding system. Formal, in-depth interviewing

of reliable informants helps to alleviate this undesirable bias. Ethnographic interviewing (Spradley, 1979), as it is often called, is not simply an information gathering technique. Rather, it is an attempt to get at the meaning of the observed situation through the eyes of the persons who are members of the group involved. In this particular study, it was important to gain an understanding of how the hearing-impaired students themselves interpreted classroom events and how they felt about being in classes with hearing students.

The second author conducted a series of interviews with one of the hearing-impaired members of the classes observed shortly after the end of the quarter. These interviews provided evidence which was integrated with that of classroom observations. It was not possible to interview the other two hearing-impaired students in these classes. Therefore, corroborative evidence is offered from interviews with another two hearing-impaired students who are in the social work program, but were not members of these particular classes. These data add to the generalizability of interview data collected.

Analysis and Findings

The results of the study will be presented in the following pages in accordance with the three goals of the study which were outlined earlier.

Instrumentation

One of the goals of the study was to determine which methods of collecting observational data would be the most efficient as well as the most effective and least obtrusive in the classroom. Participant observation and systematic observation were found to be useful, complimentary means for collecting classroom data. Several issues concerned with the use of a coding system, and with the OSIA in particular, will be discussed further.

Strategies for Encoding. A number of strategies for gathering data on classroom interaction are available. All have their advantages and disadvantages. For this study, the three strategies tried were audio-visual recording, audio recording, and live encoding.

The videotape recording for later encoding was the first method used. This method has the apparent advantage of providing a visual as well as audio record of occurrences in the classroom. Yet, there were problems with this strategy since the taping was intrusive in the classroom. The magnitude of the effects on the classroom environment, therefore, cannot be known.

We concluded that the advantages did not override the problems associated with videotaping. Along with the camera being disruptive and cumbersome, it is not clear that the record is as helpful as had been hoped. A camera does not capture the complete picture of the classroom even though it does capture manual communication. Also, the recording must be made first and then reviewed for coding, so twice as much time is spent on encoding than if the class were coded live. Other researchers have reached similar conclusions (Medley, 1975).

We next obtained an audio record. The tape recorder is clearly less cumbersome and bothersome to both researcher and subjects. However, the audio record is not suitable for analysis unless a person codes live simultaneously while collecting the audio record. Otherwise, one misses many events either because they do not come out clearly on the tape (interference or a soft voice) or because they are entirely visual events, such as the use of manual communication. It is hard to code and monitor the recorder as well.

The least obtrusive method of collecting data is through live coding. The accuracy of the coding depends on the frequency of events as well as duration. A quick succession of events is difficult to code completely, and for these times, the opportunity to replay an event is desirable for accurate coding. However, speed and accuracy in coding does increase with experience, and we have found this method of collection to be adequate in the typical college classroom. In order to insure accuracy and observer agreement, an experienced coder regularly checks another's encoding by simultaneously encoding the same class. We have adopted this method exclusively.

Computer Analysis. As mentioned earlier, the OSIA data displays have been computerized (Hough, 1980). To date, twelve programs are available to analyze OSIA data. NTID has access to three of these programs and plans to access more soon.

The most helpful display in analyzing behavior is the flowchart. (See Appendix B). The thirteen teacher and thirteen student behaviors are listed vertically. The horizontal axis is a time curve. Behaviors are therefore clearly and visually displayed in sequence, thereby preserving order. Through the flowchart, one is able to note patterns of behavior otherwise masked by content. For example, an overabundance of teacher initiation behavior is clearly displayed on a flowchart.

Another form of analysis is a matrix, or a 26 x 26 grid of behaviors -- Thirteen teacher, thirteen student by thirteen teacher, thirteen student. (See Appendix C). The diagonal of the matrix displays frequencies for each behavior. Other slots in the matrix tell how many of a certain behavior were sequenced by another behavior. For example, one can find how many student responses were followed by a soliciting clarification behavior from the

instructor. The third program provides percentages, such as percent of frequency of individual category/total amount of behaviors. (See Appendix D).

The computer programs we currently have available do not allow us to distinguish between individuals when we code their behavior using the OSIA. However, such coding is possible. Also, such analysis is descriptive as the displays only result in frequencies and percents. For our preliminary work, this analysis was adequate. Later studies will probably involve more statistical analysis requiring data on individuals. The expanded version of the OSIA (Layne, 1979) can capture data on individuals through the use of subscripts. Other computer programs will also be available later.

Validity and Reliability. What is one really trying to assess in attempting to determine the validity of an instrument? Medley (1975) refers to validity as the degree to which a score measures what it is supposed to measure. A coding system is designed to measure frequency and duration of behavior. To assess the degree of success of a coding system, one needs to look at three major aspects of the coding system and its use: objectivity, observer agreement and reliability.

Objectivity depends ultimately on the clarity of the category definitions used and on the cues by which the coder recognizes the category to which a given behavior belongs. The categories should be mutually exclusive, critical differences among categories should be explicit, and cues for discrimination should be as simple as possible. Also, there should be low inference in deciding which category to use.

The manual designed by Layne (1979) gives clear, simple cues for discrimination among 13 behavior categories. The categories requiring the least subjective decisions are also given top priority. For example, the independent

behaviors of thinking, sensing and manipulating artifacts, which are the most subjective of the categories, are recorded only if no other behavior category occurs simultaneously. The subdivision of categories, as occurring in the expanded version of the OSIA, ensures even more that the categories are mutually exclusive (see figure 1 on the following page). The categories are coded as either substantive, dealing with content or subject matter, or managerial, dealing with procedures. Mode of communication is also coded.[3] This is very important when the OSIA is used in a classroom of mainstreamed, hearing-impaired students.

Observer agreement is an important consideration, since one would hope that different coders would have similar outputs. One of the most commonly used procedures for estimating observer agreement is Scott's coefficient (Scott, 1955). Percents of tally are compared rather than rank order, since this method of analysis has shown itself to be much more sensitive to real agreement than coefficients such as Spearman's Rank-Difference coefficient of correlation (Guilford, 1956).

Reliability is also an important consideration that depends on the adequacy of a behavior sample, which in turn depends on the stability of the behavior being measured. Observer agreement is necessary for reliability, but not sufficient. For example, a single visit to a classroom may have high observer agreement, but seldom has adequate long-term reliability or validity. The best way to insure reliability is to obtain several sets of data on a particular classroom, over time, while checking for observer agreement.

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[3]Mode of Communication is defined as follows:
U = Spoken
K = Unspoken
L = Simultaneous Communication
H = Manual Communication
J = Mediated

Category Name	Category Code		Communication Code 3				
	Substansive	Managerial					
Independent							
Thinks	1	01	U	K	L	H	
Senses	2	02	U	K	L	H	
Manipulates, Artifacts	3	03	U	K	L	H	
Initiating							
Initiates	4	04	U	K	L	H	J
Interactive							
Responds	5	05	U	K	L	H	J
Solicits Clarification	6	06	U	K	L	H	J
Solicits	7	07	U	K	L	H	J
Appraisal							
Judges Correctness	8	08	U	K	L	H	J
Personal Positive Judgment	9	09	U	K	L	H	J
Acknowledges	10	10	U	K	L	H	J
Judges Incorrectness	11	11	U	K	L	H	J
Personal Negative Judgment	12	12	U	K	L	H	J
Non-functional							
Instructionally Non-functional	13 or X	13 or X	U	K	L	H	J
Separation Designation							
Interactive	Y	Y					
Serial	Z	Z					

Note: In the expanded version of OSIA, these categories are further subdivided (Layne, 1979, Hough, 1980)

Figure 1. The Basic OSIA Categories

The OSIA instrument has been found to be high in objectivity, reliable and capable of allowing for high observer agreement. The computer analyses provide helpful summaries of code data. The major deficiencies are: lack of individualized data analysis procedures on our present computer programs and the high demand on the encoder in live situations.

Data Analysis and Findings

The major portion of the data to be analyzed came from the field notes of the participant observer. These data were submitted to an in-depth analysis in the search for important behavioral categories and themes. The details of such analyses are presented by a number of authors (e.g. Lofland, 1971; Pelto & Pelto, 1978; Spradley, 1979, 1980). The reader may refer to the above for exact procedures, if desired.

Every social situation can be described along the following dimensions:

Space[4]	Activities	Meanings	Participation
Roles	Events	Intentions	Feelings
Acts	Time	Objects	

---

[4] These categories are defined as follows:
Space = the physical setting
Roles = function (and status) assigned to each participant
Acts = Behaviors that occur for short periods of time (few seconds to few minutes)
Activities = Set of related behaviors that occur over time (few minutes to a few hours)
Events = set of related activities
Time = standard units plus those periods unique to the setting
Meanings = internal definitions held by each participant and shared by others in the setting
Intentions = purposes, goals, objectives
Objects = physical "things"
Interactions = the patterns of behavior that describe the relationship among people in the setting
Participation = Patterns of behavior that describe a person's involvement in the setting
Feelings = values, attitudes, disposition

Throughout this study we attempted to describe each dimension in as much detail as possible. We also looked at how each dimension was related to the others. For example, we examined the ways space was used by people who performed various roles as well as where these people placed themselves in the setting. It should also be noted that, for a particular social situation, some of the dimensions may not be described, given the nature of that setting.

The social situations examined in this study occurred in two Social Work classrooms. Our focus was on the mainstreamed hearing-impaired students in those classes and the social events which involved them.

Many categories which might be important to an analysis of the classroom as a whole were excluded because they were found not to be relevant to the experiences of the hearing-impaired students. Time, for example, emerged as important to these class situations: being on time, having enough time, making good use of the time allotted. However, we found that this category is not uniquely important to the participants in these two settings, and, hence, has not been the subject of in-depth analysis. Some categories are important only as they relate to other categories. Use of space, for example, is important because we found that it directly affects the participation of the hearing-impaired students in class discussion. Thus, the data were re-analyzed, as it were, in terms of those dimensions which pertained directly to the hearing-impaired students and their experiences. Other classifications were noted, but are not reported here unless they contrasted the hearing with the hearing impaired in the classes observed.

Three dimensions emerged from the data analysis as being important to the hearing-impaired students in the two social work classes. These dimensions

are of sufficient generality that they may be assumed to apply in other classroom situations and should be tested through future research. Two of the dimensions which are examined here may be grouped under the more general heading of communication. These two are Participation and Relationships (as demonstrated by Interactions). A third dimension, that of Feelings, is related to student roles. A description of the three dimensions is presented in the following portion of the paper. We have included participant observation, interview and interaction analysis data in these descriptions.

Participation. In the standard lecture format of the usual college classroom, student participation is relatively infrequent. The classes which were observed during the current study were very different in this regard. They allowed for, indeed were dependent on, student participation. Thus, the observer was given the unusual opportunity to see many aspects of classroom discussion which strongly affect the ability of the hearing-impaired student to take part. These effects would not have been as evident in the more usual college classroom over such a short period of time as one, ten-week quarter.

Barriers to participation are an enormous obstacle for the hearing-impaired student to overcome. The student who requires the use of an interpreter must deal with the lag which necessarily occurs between the message given and its reception. The student who is hard of hearing, speechreads, or needs no interpeter, is still in the position of needing to focus a large amount of effort simply on getting the message. They have much less left over for taking part in class discussion.

The necessary criteria for student participation in a class discussion are preparedness in the subject matter, willingness to participate, opportunity,

and being "up with the class." The last of these criteria is the one which presents the deaf student with the greatest challenge. The communication lag prevents them from sitting back and taking it all in as a hearing person would do. It soon becomes readily apparent to an observer that the successful hearing-impaired student develops strategies for keeping up with a discussion and monitoring the rest of the class. Some of these strategies include a deliberate shifting of attention from directly on the interpreter to speaker and back again, along with the use of eye contact to engage the speaker's attention. One student reported that if she had trouble figuring out what was going on in class, she watched the responses of other students to see how they were responding. Students with some residual hearing will concentrate on the speaker as much as possible, checking with the interpreter to pick up pieces missed. Given these strategies, a relatively active hearing-impaired student is able to make himself/herself known in an integrated classroom. There are, however, many things which will work against the participation of hearing-impaired students and leave them behind in class, locked in on the interpreter.

The most obvious deterrent to class participation by hearing-impaired students is the rate of presentation or of discussion. This is usually the result of the instructor's style of teaching or rate of speech. In a straight lecture situation where the chief need of students is to get the material presented, this is rarely a problem. If the interpreter is competent, the message will eventually get across despite a rather long lag. Students will be isolated from the rest of the class, nonetheless, as they focus all of their attention on the interpreter.

In a class situation where the students are expected to respond, however, a lengthy lag either leaves them unable to respond, or in danger of responding inappropriately if they try. That is, they may raise an issue or answer a question which has already been discussed by someone else. The net effect of rapid presentation, then, is to create an island of deafness in the classroom, a temporal island where students appear passive and unresponsive. It is where they respond inappropriately, embarrassing themselves and others, and where they will even laugh at jokes after everyone else has finished.

The barrier created for the hearing-impaired student by a rapid rate of discussion or presentation is compounded even further when there are many speakers involved as would happen in the case of a whole class discussion. If speakers jump in and out of a discussion very quickly, the message which comes through the interpreter is one long, undifferentiated string of words, as if from one speaker. Certainly, the interpreter will point to the person speaking. But, if the interaction is going on rapidly, there is no time for the hearing-impaired person to break away from the interpreter and to focus on the speaker. These two barriers to the participation of the hearing-impaired student in an integrated class were corroborated during observations in another social work class in the following quarter:

> (The support team person) brought up a concern which she had for the deaf students in that class. She pointed out the fact that it is very difficult for the interpreter to keep up when people talk fast. She hoped that people would become aware of how fast they were talking and also on how quickly they jump into a conversation. It can become impossible for deaf students to keep up with a conversation.

> They are waiting for the interpreter while people are jumping in here and there and everywhere. It all comes out as sort of a hodge-podge when the interpreter has put it all together into one package. She went on to ask if the deaf students would want to make any comment. One student said, "Yes, there are times when it is really very difficult to keep up." A woman student who had more hearing than the other said that she could see what it was like. When she was without her hearing aid, she was much slower in responding.
>
> (S. W. Class II, 10/10/80)

The contrast in rate of discussion and the number of participants was strongly evident in the two classes which were observed. In one of the classes, an effort was made to involve all of the students. Individuals were requested to identify issues of interest. The flow of discussion was orderly with people waiting to be identified before speaking. A concerted effort was made as well to involve the hearing-impaired students. In the other class with the same group of students, the discussions were in a less-structured conversational mode with people contributing as they saw fit, but with the instructor setting the pace. OSIA data, along with participant observation records, show that overt behaviors in this class came almost exclusively from the instructor and a few assertive hearing students. Few contributions were made by the hearing-impaired students. A case can be made for the learning environment in each class. But, the hearing-impaired students had positive feelings only toward the first class, "where everyone has a chance to say something." The other class was often referred to with the manual communication sign for boring. It has also become clear that when effort is made to involve hearing-impaired

students in a discussion, the more reticent hearing students will become involved as well. Therefore, there is a spread of effect that benefits the entire class of students, both hearing and hearing-impaired.

Language barriers may also be a problem for some students. During the interviews with the one hearing-impaired student, she indicated that she often had trouble finding the right words to use in class. She found it easiest to participate when the class discussion focused on something in her past experience rather than on new ideas. Another student once pointed out in class that he had grown up with American Sign Language, a language that the other students had not been raised with. Very often people laughed at jokes which he didn't find particularly funny--at least as they were interpreted. Thus, there may be cultural barriers to student participation as well as those which originate in the organization of the classroom.

In summary, a hypothesis in regard to the ability of hearing-impaired students to participate in an integrated classroom may be formulated as follows:

Hypothesis 1: The successful participation of hearing-impaired students in the activities and discussions of the regular classroom is adversely affected by the fast pace of discussion and by the numbers of persons who participate in a given amount of time.

Hypothesis 1a: The cooperation of all persons is necessary to facilitate the participation of hearing-impaired students, but the instructor is ultimately responsible for actively involving them. This calls for training or sensitizing of instructors.

Hypothesis 1b: Anything done to facilitate the involvement of hearing-impaired students will tend to benefit the hearing students as well, particularly those who are less active.

Interaction. The normal exchange of ideas and pleasantries between persons in a social situation, such as the classroom affords, is not a matter of concern to most people. However, to the hearing-impaired student, a simple attempt at conversation or a request for assistance from an instructor may become another encounter with a barrier to communication. There are parallels between the problems encountered by hearing-impaired students in class participation and in interaction with other individuals since both hinge on communication. However, there are differences--enough to consider these two areas as different categories.

The amount of interaction between hearing and hearing-impaired students in a mainstreamed classroom provides some measure of the degree of student integration. Interaction is dependent on familiarity, acceptance, and on a shared interest. Therefore, it is not too surprising to find that interaction between hearing and hearing-impaired improved, subtly, over the quarter in which the two classes were observed. The problems involved were not primarily dependent on mode of communication. They did, however, stem from such differences. Some of the hearing students were able to use sign language; all of the deaf students were competent speech readers. No one learned any more sign language. None of the deaf students changed in speech or hearing. Yet the differences from beginning to end of the quarter were striking.

The beginning of a quarter in a new class where instructor and classmates are unfamiliar calls for many adjustments on the part of every individual.

For most students, communication and the usual person-to-person interactions is not one of these adjustments, however. For the hearing-impaired student, such communication concerns override all others. For example, at the first session of one of the classes, the instructor stopped two of the hearing-impaired students at the door of the classroom and tried to tell them that they should mail their assignments to her if they should ever have to miss a class session. After several futile attempts to get her message across, she called over the interpreter for assistance since neither she nor the students had understood each other. During one of the last sessions of the quarter in a similar situation with the same two students, she was able to get a point across and able to understand the students' responses without the aid of the interpreter. Clearly, interaction is more than an exchange of words!

Many of the problems which arise in interaction between hearing and hearing-impaired persons seem to arise from a lack of shared context or understanding and the uncertainty that goes with such feeling. Even seating choices and class arrangements reflected this uncertainty.

The morning class was conducted with all persons (including the observer) sitting in a circle. This arrangement was advantageous for the hearing-impaired students since they could sit anywhere in the circle and see everyone as well as the interpreter. However, the three of these students in the class sat together at the beginning of the quarter most of the time. Over the course of the quarter, there was a noticeable change in the tendency for deaf to sit with deaf and of hearing to sit with hearing. By the end of the quarter people seemed to seat themselves around the circle without regard to hearing or deafness. There was a corresponding change in the mixing of people before and

after class. This was not as marked, however, and the shared experiences of the hearing-impaired students seemed to have some tendency to hold them together. One student's perception of the situation was that hearing-impaired students tended to stay together as did hearing students. This separation was even more marked in social situations.

The other class observed was conducted with a more standard seating arrangement. In this class, the hearing-impaired students were confined to sitting in the area directly in front of the interpreter. Some change was noted in student interaction, however, over the course of the quarter, as had been noted in the other class.

Interaction between hearing and hearing-impaired persons in a public setting where an interpreter is necessary can become a very complex matter. Witness the possible sources of confusion in the following discussion which was recorded in one class where several means of communication were used simultaneously:

> There was quite a bit of discussion on this topic between _____ and _____. _____ acted as a go-between for the instructor and the student because he was able to use simultaneous communication. The interpreter was supplying reverse interpreting for the instructor and signed interpretation for the hearing-impaired student. There was, in fact, a conversation going on in four modes at once. It became quite confusing for the instructor because she had to deal both with the delay and the reverse interpretation on top of straight spoken conversation. The message eventually got through, although it took extra effort on everyone's part. (S.W. Class I, 7/3/80)

The success of interaction under conditions such as those described above depends, ultimately, on the ability of the persons involved to use the interpreter properly.

Even the most skilled of interpreters cannot bridge the communication gap effectively if the persons involved are unwilling or unable to cooperate. Most hearing persons assume that the interpreter is only for the hearing-impaired individual and fail to assume any responsibility for the quality of the interaction. Thus, we hear or see such situations where the hearing person will talk to the interpreter saying, "Tell him/her thus and so." Such horror stories cannot be told of the classes which were observed in the social work department. Yet, during the course of the observation, it became clear that the subtleties of communication which are essential for the comfort of all concerned and for the flow of communication are not easily acquired.

It is difficult, at first, for a hearing person to maintain contact with a hearing-impaired person who is speaking in sign when the voice he hears is coming from an interpreter. It is difficult to look at a person when one is speaking if that person must look at the interpreter in order to get your message. All of this takes practice and active awareness on the part of all individuals involved.

In the classroom situation where the subject matter is all important, such concerns can easily be relegated to a secondary position. The student who was interviewed gave a personal perspective on this problem. She found it disconcerting when she was speaking to the instructor and had established eye contact to find that the instructor would turn and look at the interpreter when she answered the student.

As was indicated earlier, many of the problems involved in the interaction between hearing and hearing-impaired persons in the classroom overlap with those of student participation. Participation is a problem arising out of well-established patterns of teaching and running a class. It is probably more resistant to change because it requires the active will of an instructor to effect changes or manage a group of students. Interaction takes personal understanding on the part of both individuals and groups.

It is well to note that hearing-impaired students have strategies for dealing with hearing persons in social interaction, as well as for particiation. Most of them are willing to take the initiative in a conversation and are extremely patient with the hearing person who is willing to meet them halfway.

Interaction between hearing-impaired and hearing persons in a mainstreamed class situation may be explained by the following hypothesis:

Hypothesis 2: The interaction between persons in an integrated classroom is dependent on their becoming comfortable in each others' presence. This is gained through shared experiences in the class context. It is also gained when persons who use different modes of communication learn to use an interpreter to the best advantage.

Feelings. The final dimension which will be described is that of the feelings of the hearing-impaired student in the mainstreamed situation. This category is less well-developed in the present research data than the other two which have been presented, but it may prove to be of far greater significance in future studies. It is believed at the present that the feelings described relate most strongly to student role and student's perceptions of

themselves in regard to it. Hearing-impaired students expressed their feelings, both directly and indirectly, in regard to their position in the mainstreamed classes and the expectations which hearing persons have for them.

It was quite clear from what was seen in the two classes observed that the hearing-impaired students wished to function on the same level as other students. They volunteered for special assignments, they came to class regularly, they prepared assignments, they participated in class discussion, they took an active part in class social functions. Bad feelings about themselves and others came from being made to feel different, like outsiders. Feeling different was not bad because they were made to acknowledge their hearing problem, but because the focus was on the problem rather than on themselves as individuals. "I am a student who happens to have a hearing problem," they appear to be saying, "not a case of deafness trying to act like a student." Good teachers, according to one group of students interviewed, are the ones who don't make the hearing-impaired students feel different.

Both the patronizing attitude of some hearing persons toward the hearing impaired and ignoring the true needs of such students are detrimental to students' feelings about themselves. It is also detrimental to their sense of being a part of the classes they attend.

The road to achieving a full student role is a difficult one for the hearing-impaired student as well as for the persons who work with them. As these students struggle to balance their true needs against over-dependency on support personnel and instructor indulgence, many conflicts and uncertainties arise. In one of the classes observed, the researcher witnessed a polite but emphatic protest by the hearing-impaired students who felt they were being shunted to the side

and treated much as second-class students because they were always assigned to the support team person for advice and supervision. They felt that their needs as hearing-impaired persons were being given far too much emphasis at the expense of their needs as students. In this particular situation, the instructor was able to compromise by sharing some aspects of supervision for all students. Yet, the student interviewed said that the support person was not needed at all because it made the hearing-impaired students feel too special to have that person in the class.

The solution to this conflict is not simply to withdraw support services or to cut them back. Hearing-impaired students face real problems directly associated with their hearing loss which cannot be handled by the instructor, who is an expert in the subject matter of the course only. Privately, the students acknowledge this by going to the support person for help and counseling. Publicly, they wish to be as independent as the hearing students who need no support. The use of peer tutors and notetakers may help to make the hearing impaired feel less set apart. This practice may also aid hearing students.

Continuing studies are beginning to show how closely students' problems are tied up with their self-acceptance and self-acknowledgement of their hearing loss. This is clearly an area of research in which we have only scratched the surface. True mainstreaming of the hearing impaired can come only when those students feel fully able to assume the role of student in the classroom. Their feelings about being treated as different are simply one indication that full integration of the hearing and hearing impaired has not taken place.

Hypothesis 3. Mainstreaming is successful when hearing-impaired students feel fully able to function as students in the classroom and where their needs for support are met without setting them apart from other students. This is likely dependent on the attitudes, maturity, and self-acceptance of the students themselves along with the sensitivity and concern of the instructors and class members.

The three hypotheses which were presented and discussed in the foregoing portion of the paper represent areas of concern for future research. Of overriding interest, it would seem, is the way in which hearing-impaired students strive to fulfill the role requirements of being a student in the classroom. They have strategies for dealing with communication needs and with interpersonal relationships. They have feelings about being treated as different--as deaf rather than as individuals. They have conflicts about themselves which are related to the differences between the way they see their role and how others seem to view them. The whole complex of categories and cross-categories which include roles, intentions, meanings and communication, ought to be the focus of work in the future.

Reciprocity

Educational researchers and practitioners have long decried the time lag involved in the transformation of research results into educational practice. Various attempts to shorten this lag and to make research more sensitive to the needs of the classroom have been made by involving the teacher in the research process itself. Studies such as those carried out by Smith and Geoffry (1968) demonstrate that such cooperative effort is possible. More recent work

(Tikunoff, Ward & Griffin, 1979) has directly involved a teacher and a developer in all stages of research from planning through implementation.

It is not always possible to involve teachers directly in the research process. However, in research studies which involve the use of the classroom, teachers are in a position both to assist in the research process and to benefit from having a researcher in the classroom. Particularly in situations where observational data are being collected, the teacher can be allowed the opportunity to make use of such data for instructional purposes. This has led to a policy of reciprocity through all of the mainstreaming research being conducted at RIT.

Reciprocity is simply the policy of allowing the cooperating instructor to make use of the data collected in his/her classroom if they see fit. Thus, some immediate benefit is offered to the instructor for having research take place in his/her class. There are naturally some restrictions on the kinds of reciprocity which can be offered. Confidential matter cannot be shared, of course. However, observational data on public behavior in the classroom does not fall into that category. Neither will a researcher become involved in the instruction of a class to the extent that the aims of the research itself are jeopardized. This might happen if the researcher was expected to assist in teaching the class or in other ways take part in instruction.

Other restrictions apply to different situations. If instruction is part of the research focus, then it would be wise to provide the instructor with information at the close of the study rather than a feedback during the instructional period. Researcher and instructor must both carefully consider the

effects on both the classroom and on research goals when considering such a cooperative effort.

The opportunity for reciprocity was present in both of the classes observed in the social work department. Such reciprocity took the form of instructional feedback in the Morning class and the use of videotape cameras in the Afternoon class.

Feedback was requested from the instructors in the Morning class because of the unusual instructional situation. In this class, the support team person for the hearing-impaired students co-taught the class because of his role as the students' field supervisor. The instructors were concerned about coordinating their efforts effectively. They were also concerned about the possibility of their dominating the discussion through the force of their presence. They also had more direct instructional concerns such as involving all the students in the discussions and improving the generality of the material covered. They asked that the researcher provide feedback at times when it seemed relevant. It was possible for the researcher to do this because the focus of the research was not on the instruction per se. Ongoing conferences between researchers and instructors provided the researcher with the opportunity to triangulate the data even further by adding the instructor's point of view to that seen by the observer in the classroom. This particular cooperative effort has since evolved into a systematic plan for research on instructional improvement. Coded data from the OSIA has been added to the feedback method.

The second opportunity for reciprocity was more pragmatic and less far reaching. In testing the various methods for coding observational data with the OSIA, it was necessary to try recording the classroom with a videotape

camera. It was determined that the Afternoon class would be the most advantageous place to use this method because of the class arrangement. When the instructor was approached to allow the camera in the classroom, she was not only agreeable to the idea, but indicated that the videorecording would be of some use to her in providing students feedback on their roleplay assignments. Roleplays were short, skit-like exercises in which the students took the parts of social workers and clients in order to practice their fieldwork techniques. The use of videotape enabled the students taking part in the roleplay to see themselves and better understand the comments made by the instructor and their peers.

In order to collect both research data and provide the class with needed feedback, the videocamera was on in the class before, during, and after the roleplay segments. From a strictly research-oriented, data gathering perspective, this arrangement was probably not ideal. However, since our major purpose in using the cameras in the classroom was for judging that particular vehicle for recording the classroom, this did not pose a problem.

It is not always possible or desirable to provide for reciprocity with instructors when collecting observational data, especially in classes with a lecture format. If interaction analysis, as with the OSIA, is used, it is possible to offer to share the data with instructors--especially if flow charts are produced. Obviously, not all instructors will welcome even such non-evaluative feedback. Therefore, caution must be used in presenting such. Receptivity to such materials probably varies with the self-confidence and skill level of the individuals involved. Another study conducted by the first author (Saur, 1978) indicated that skilled instructors are not threatened by

the record of their own in-class behavior. However, to maximize the benefit of such sharing, the researcher must take the time to explain the flow chart, codes used, and the interpretations which can and cannot be made from the data as they are recorded.

CONCLUSIONS AND RECOMMENDATIONS

The study which has been reported in this paper was successful in answering the three questions set out at its inception. In these concluding remarks, we will discuss each of the questions addressed individually as well as the conclusions which flow from them.

Instrumentation

The three methods used to triangulate the data in the present study were systematic observation (interaction analysis), participant observation, and interviewing. Each of these methods for collecting data had its strengths in addition to its weaknesses. Together, they provided an effective approach to the initial study of mainstreaming in the college classroom.

Systematic Observation

There were two purposes involved in using systematic observation as one of the methods for the present study. The first was to judge the relative merits of various means of encoding data. The second was to determine the sufficiency of the OSIA as a method for classifying classroom interaction.

The Means for Data Collection. As was reported earlier in this paper, three methods were used to encode classroom data: videotape recording of classroom interaction, audiotape recording, and live encoding. Of the three methods tested out, only the live coding proved to be sufficiently unobtrusive to warrant further use as a data gathering device. We strongly object to the use of

recording devices of any kind for naturalistic research in classrooms. This objection may be qualified somewhat by applying it most strongly to the college classroom. One might find the use of such methods less objectionable in pre-school or early elementary classrooms, as children may possibly adapt more easily to the camera's or recorder's presence than do adults. At the college level, it is even difficult for the observer to become unobtrusive.

Without the recording device, the major concerns for coding is reliability both intra- and inter-rater. The only safeguard against intra-rater unreliability is a well-trained observer whose skills are kept well-sharpened through regular use. Inter-observer reliability can be monitored through dual coding by two observers in the same classroom.

The goal in collecting interactional data is to gain a valid picture of the patterns of interaction in the classroom. Any observer or data collecting device will disturb this environment somewhat. We can only use such precautions as are available to us. This means foregoing all methods of collecting data which will draw attention to the fact that observation is taking place in the classroom.

The OSIA. In selecting the OSIA as our coding system, we have chosen a highly complex, powerful system which is able to deliver data in many forms. We believe that selecting such a versatile system is desirable because of the high cost of collecting observational data both in time and in dollars. Our feeling at the present is that the flow chart representation of the data from sequential coding is one of the more valuable products of the system.

An additional advantage of the OSIA is that it is an instrument of proven worth which has been developed over an extended period of time. Its categories

are, for the most part, of low inference, giving one cause to trust the validity of the data collected. We feel well justified in using such an instrument rather than going through the common practice of developing a new instrument for a new coding situation.

Participant Observation

The collecting of qualitative data through the use of participant observation proved to be the most fruitful portion of the data collection which was undertaken. By sharing the experiences of both hearing and hearing-impaired students in real classrooms, the observer gained some understanding of the demands which a hearing impairment makes on a student in a mainstreamed class. We cannot claim to have achieved a complete understanding, this would be presumptuous, but we have identified areas of concern which should be investigated in future research.

Participant observation is by far the best tool for exploratory work in a new area of social research. It does, however, have its drawbacks. In the first place, it is time consuming at all stages from data collection through the final analysis in a way no other form of research demands. In the second place, it is extremely fatiguing to the observer. There is little wonder that most persons who undertake observational research experience a form of "burn-out" and must get away from the field periodically to regain their enthusiasm.

We intend to continue the use of participant observation as we explore the experiences of mainstreamed students. However, we are likely to fall back on more quantitative methods as problems and hypotheses are identified. Such methods will aid in generalizing our results to other groups of hearing-impaired students.

Interviewing

The technique of ethnographic interviewing may prove to be of more value on an ongoing basis to the study of mainstreaming than will participant observation. Meanings, feelings, and perceptions of students are much more quickly discerned through the interview process than through observation. This technique is extremely valuable as we attempt to learn what makes mainstreamed hearing-impaired students successful at the post-secondary level.

Again, the technique also has its limitations. Students must be available for interviews. Most often, they will be interviewed individually. Thus, there are concomittant problems in scheduling and in availability. It is likely that the insights gained through the interview process will lead to the construction of paper and pencil instruments to measure student attitudes and perceptions. This is, however, a prospect still far in the future. Thus, interviewing will continue to play a role in our work for some time to come.

Research Questions

The research which has been reported in these pages was conducted as a pilot study for the purpose of identifying areas of interest for future research and to formulate hypotheses about the hearing-impaired student in the mainstreamed classroom. It is clear from what has been seen thus far that hearing-impaired students need to feel themselves a part of the classes and programs in which they are involved. They need to fully assume the role of the student. This means to be able to participate, to develop relationships and not to be made to feel different. It also means being able to acknowledge one's needs, accept one's hearing loss, and have one's special needs met without feeling stigmatized. All of these topics of interest call for future

research to determine how studentship may best be achieved for the hearing-impaired student in the integrated classroom. The students we came to know through this research are academically successful and are receiving what can be characterized as an appropriate education. That is, they have chosen a program of study suited to their talents and aspirations and are meeting the requirements for a degree. However, future study is needed to determine what carryover may be important to the success of these students in the working world beyond the college campus.

Such future studies may be approached from the classic, sociological point of view, using analytic induction (McCall & Simmons, 1969). Through this process, hypotheses generated in one environment are tested in a similar setting for either rejection or refinement. This method may become long and involved when one is looking at many different settings. It also falls somewhat short of the sufficiency criteria because one cannot judge the hypothesis in every possible instance of the phenomenon being studied. For this reason, among others mentioned earlier, it is likely that we will eventually resort to more standard, quantitative measures for at least some of our data collection.

Reciprocity

It is clear from the experience gained while collecting data in this initial study that reciprocity with cooperating instructors is both feasible and desirable in classroom research. Many instructors chafe at the isolation which they feel in the standard classroom and welcome a chance to obtain feedback and to speak of their concerns for their students to someone who is genuinely interested. Others may have insights which are valuable to the researcher. It is hoped that through continued positive contact some of the

antagonism often felt by teachers toward researchers may be mitigated, at least on an individual basis.

Future Prospects

We are well aware that mainstreaming means more to hearing-impaired students than simple in-class relationships and role. It will be necessary in future work to branch out into other activities which are an important part of student experience--dorm life, athletic teams, intra-mural sports, to name a few. The barriers to full participation by the hearing-impaired student in these situations may be similar to what has been seen in the classroom, but other categories may be important as well.

Finally, we feel that the three areas dealt with in this pilot study should become major considerations in every classroom observational study conducted. Instrumentation, research focus, and practical applications all contribute to the validity, reliability, and utility of the research outcomes. For what observational research costs in terms of people, time, and money, we cannot afford to neglect any of these concerns.

APPENDIX A

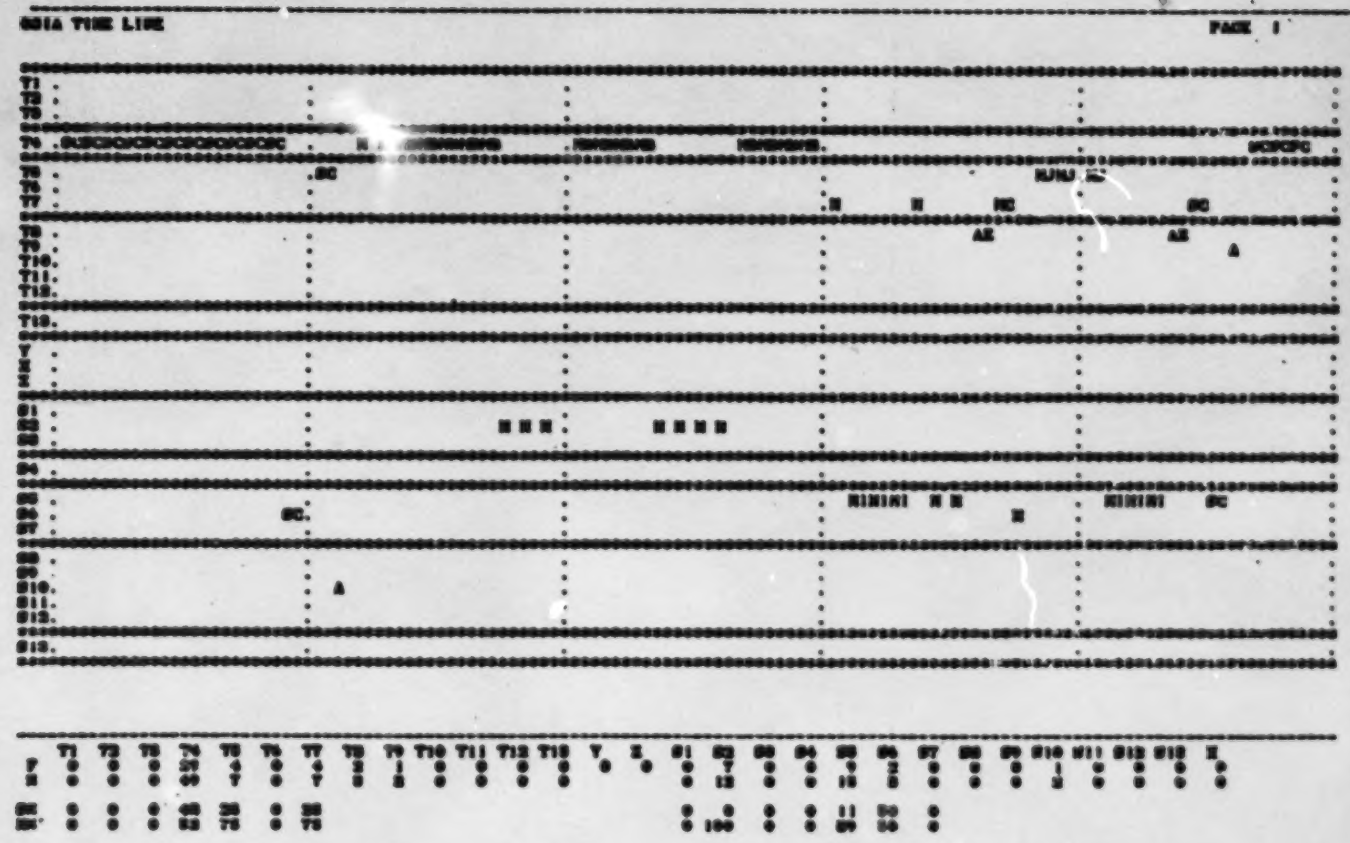
Protocol for Field Notes

Name of Researcher:
Date of Observation: July 17, 1980
Subject of Observation:
Session: E

The class began shortly after nine o'clock with five students present along with the two instructors and the interpreter. Two students were late. They arrived quite a while after the class had started. began the class by identifying topics that had been discussed during the previous class session and indicated that they intended to go on discussing issues from there. In accordance with my focus, which has developed over the past few weeks, I intend to leave out as much of the content as possible from now on concentrating more on the patterns of communication and on the participation of various students in the classroom. indicated that they would continue to discuss the issues which students have brought up in the class at a previous time. She indicated that had brought up a particular issue and that they wanted to discuss that. had also brought up an issue and they would probably get a chance to talk about that one as well. was concerned about developing her counseling skills. She thinks that she is difficult to understand when she speaks in class. It was necessary for the interpreter to reverse interpret for her and he at times had difficulty understanding what she was trying to communicate. However, she was not at all hesitant about explaining her problems. She was concerned about developing her skills as she was only working with one very low verbal deaf client and she felt that she was not getting the chance that she needed to improve her counseling skills. This brought up the question of "What was counseling?" and as is very often the case, volunteered his opinions and began a rather long conversation involved with the process of counseling which was really not so much of a definition but an example of counseling. also volunteered an example of part of the counseling process. He was very willing to express himself as usual. He did not need any particular help

APPENDIX B

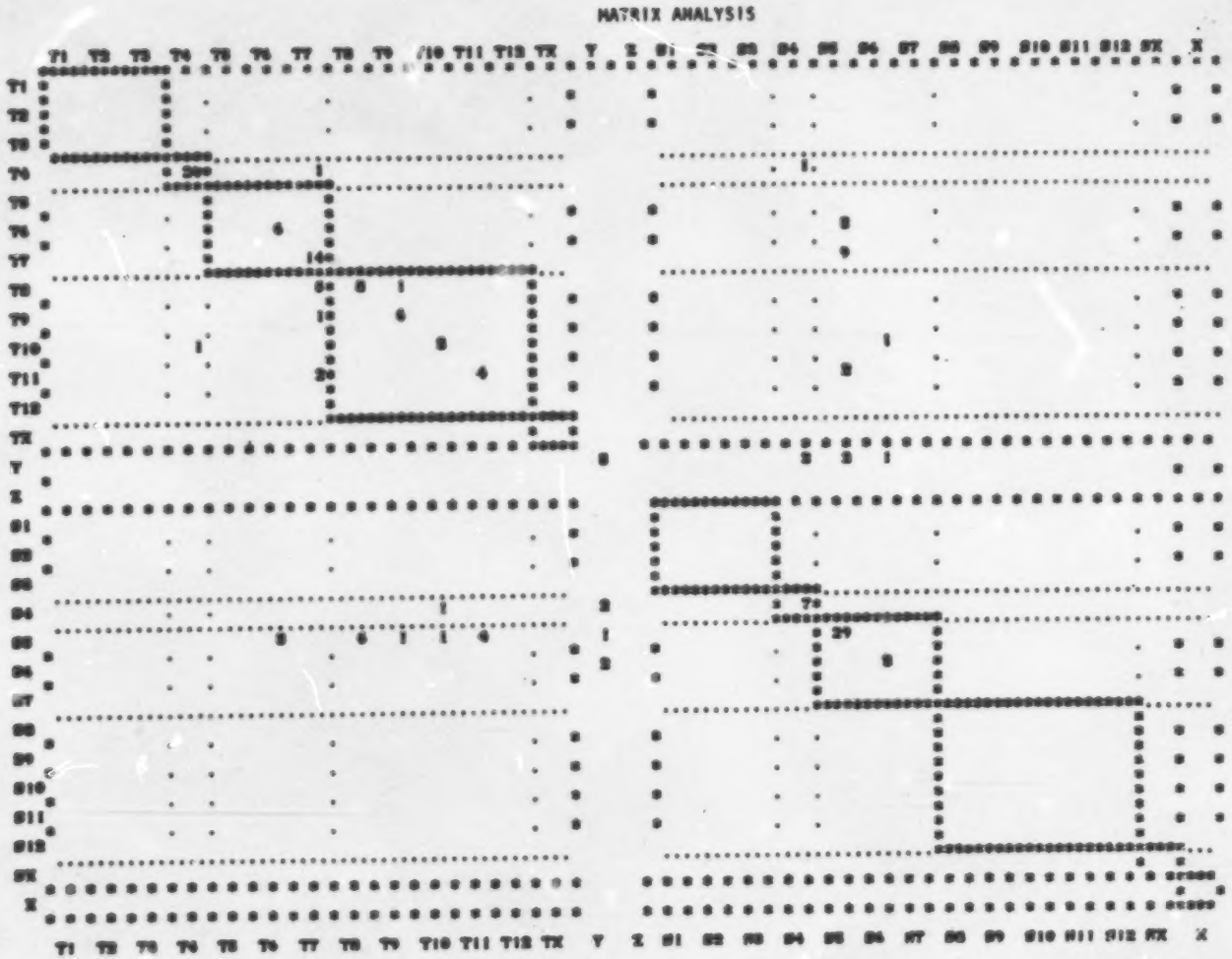
OSIA - Flow Chart



(Taken from Hough, 1980)

APPENDIX C

OSIA - Data Matrix



(Taken from Hough, 1980)

APPENDIX D

OSIA - Context Analysis

STRATEGY CONTEXT ANALYSIS

	TOTAL		ACTOR								FUNCTION							
	TOTAL		TEACHER		STUDENT		OTHER		EXT./REAL NON-FUNC.		PUB.		BAR.		APPRAISAL		NON-FUNC.	
	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%
DIRECT ---------- (EXPOSITORY)	99	37	19	8	11	4	68	24	0	0	77	81	18	8	0	0	0	0
INTERACTIVE -- (SOCIOPSYCHOLOGICAL)	156	63	92	37	64	26	0	0	0	0	86	35	48	18	26	10	0	0
INDEPENDENT -- (PRIVATE)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	SETTING								OBSERVATION FOCUS							
	CLASS		GROUP		TUTOR		INDEP.		OTHER		INST.SET.		TEACHER		STUDENT		OTHER	
	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%
DIRECT ---------- (EXPOSITORY)	99	37	0	0	0	0	0	0	0	0	0	0	99	37	0	0	0	0
INTERACTIVE -- (SOCIOPSYCHOLOGICAL)	48	20	108	44	0	0	0	0	0	0	108	44	48	20	0	0	0	0
INDEPENDENT -- (PRIVATE)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(Taken from Hough, 1980)

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